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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/437,489	11/10/1999	HIROHIKO ISHII	99224	8040

7590 09/17/2004
Amir H. Behnia
Dennison, Schultz, Dougherty & MacDonald
1727 King Street,
Suite 105
Alexandria, VA 22314

EXAMINER

KIM, DAVID S

ART UNIT	PAPER NUMBER
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2633

DATE MAILED: 09/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/437,489

Applicant(s)

ISHII, HIROHIKO

Examiner

David S. Kim

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 July 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2,3,5,6 and 8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2,3,5,6 and 8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Objections

1. **Claim 8** is objected to because of the following informalities:

In the 2nd to last line, "the infrared rays emitting element" is used where – the infrared rays emitting elements – may be intended.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. **Claims 5-6 and 8** are rejected under 35 U.S.C. 103(a) as being unpatentable over Rosenberg (U.S. Patent No. 5,506,445) in view of Ito et al. (U.S. Patent No. 5,130,531), Yamana et al. (U.S. Patent No. 5,418,384), and the admitted prior art.

Regarding claim 8, Rosenberg discloses:

An IR communication device comprising:

a substrate having a rectangular shape in plan view comprising a longitudinal X-direction, a lateral Y-direction, and an upper surface having an electrode pattern formed thereon (Figs. 2A-3D, col. 2, l. 50-57);

an IC chip (IC 101 in Fig. 2A) and other electronic parts (capacitors 102 in Fig. 2A) mounted on the electrode pattern on the upper surface;

an infrared rays emitting element (LED 104) mounted on the substrate and arranged in the X-direction;

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an infrared rays receiving element (photodiode 106) mounted on the substrate at the position in the X-direction;

the infrared rays emitting element and the infrared rays receiving element being connected to the IC chip and the electronic parts for operation (Fig. 2A);

a first lens (lens 121) provided on the infrared rays emitting element; and

a semispherical second lens (lens 123) provided on the infrared rays receiving element.

Rosenberg does not expressly disclose the following limitations:

(i) a *plurality* of infrared rays emitting elements mounted on the substrate and arranged in the X-direction;

(ii) a resin covering the infrared rays emitting elements, the infrared rays receiving element, the IC chip, and the electronic parts mounted on the substrate;

(iii) said first lens *formed on the resin so as to be elongated in the X-direction to have opposite longitudinal ends* and provided on the infrared rays emitting elements;

(iv) said semispherical second lens *formed on the resin so as to be* provided on the infrared rays receiving element;

(v) a sectional shape of the first lens and a position of each of the infrared rays emitting elements with respect to the sectional shape of the first lens being selected, so that infrared rays radiation range is expanded in the X-direction over the two opposing ends of the first lens; and,

(vi) a shielding member for shielding the infrared rays emitting element, the infrared rays receiving element, the IC chip, and the electronic parts.

Ito et al. teaches a communication device wherein a resin covers all the components mounted on a substrate and wherein a first lens and a second lens are formed on the resin (Ito et al., Figs. 5-7 and 16-21, col. 2, lines 34-64, col. 8, line 23-51). At the time the invention was

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made, it would have been obvious to a person of ordinary skill in the art to modify the device of Rosenberg to incorporate these resin and lens teachings of Ito et al. One of ordinary skill in the art would have been motivated to do this to minimize the number of parts and assembly steps (Ito et al., col. 2, lines 59-62). Accordingly, Rosenberg in view of Ito et al. would meet limitation (ii), part of limitation (iii), and limitation (iv).

Yamana et al. teaches such a *plurality* of light emitting elements (Yamana et al., light-emitting diode chips 2 in Fig. 1, col. 3, lines 1-2) and first lens (Yamana et al., col. 3, lines 21-36, Fig. 2) *elongated in the X-direction to have opposite longitudinal ends* (Yamana et al., opposite longitudinal ends of cylindrical lens 4 in Fig. 1), a sectional shape of the first lens in the X-direction and a position of each of the infrared rays emitting elements with respect to the sectional shape of the first lens being selected, so that infrared rays radiation range is expanded in the X-direction. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to incorporate the plurality of elements and first lens of Yamana et al. in the device of Rosenberg in view of Ito et al. One of ordinary skill in the art would have been motivated to do this since "light rays which have passed through that surface [lens] portion are collected more closely along the optical axis of the lens" (Yamana et al., col. 4, lines 3-5, Figs. 2 and 8). This increased collection of light rays along the optical axis of the lens enables one to focus the light rays in a particular direction with less scatter toward peripheral directions. Additionally, the plurality of elements of Yamana et al. would increase the light intensity of the light-emitting portion of Rosenberg in view of Ito et al. Such an increase in light intensity would also increase the transmission range of the device of Rosenberg in view of Ito et al.

Rosenberg in view of Ito et al. and Yamana et al. does not expressly disclose:

the infrared rays radiation range being expanded over the two opposing ends of the first lens.

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However, one of ordinary skill in the art would notice that infrared rays (from the plurality of infrared rays emitting elements) incident at the first lens surface of Rosenberg in view of Ito et al. and Yamana et al. would inherently refract. In particular, some infrared rays would refract over the two opposing ends along the X-line of first lens, inherently expanding infrared rays radiation range in the X-direction over the two opposing ends of the first lens. Accordingly, Rosenberg in view of Ito et al. and Yamana et al. would also meet limitation (i), the remaining part of limitation (iii), and limitation (v).

Limitation (vi) is also known in the art. The admitted prior art teaches a shielding member for shielding infrared rays emitting elements, an infrared rays receiving element, an IC chip, and electronic parts (Applicant's specification, p. 2, l. 7-12). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to employ such a shielding member as part of the device of Rosenberg in view of Ito et al. and Yamana et al. One of ordinary skill in the art would have been motivated to do this to block outside noises (Applicant's specification, p. 2, l. 9-11).

Regarding claim 5, Rosenberg in view of Ito et al., Yamana et al., and the admitted prior art discloses:

The infrared communication device according to claim 8 wherein the first lens is elongated in a horizontal direction (Yamana et al., Fig. 1)

Regarding claim 6, Rosenberg in view of Ito et al., Yamana et al., and the admitted prior art discloses:

The infrared communication device according to claim 8 further comprises a reflective cup enclosing the first lens (see Figs. 1-3 and the corresponding descriptions in col. 2, lines 55-60; col. 3, lines 10-20).

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4. **Claim 2** is rejected under 35 U.S.C. 103(a) as being unpatentable over Rosenberg in view of Ito et al., Yamana et al., and the admitted prior art as applied to claim 8 above, and further in view of Amano. Rosenberg in view of Ito et al., Yamana et al., and the admitted prior art discloses all the limitations of claim 2 except for said first lens having a semi-cylindrical shape. However, Amano teaches such a lens having a semi-cylindrical shape (see Fig. 9). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to use the semi-cylindrical shape of Amano for the lens of Rosenberg in view of Ito et al., Yamana et al., and the admitted prior art. One of ordinary skill in the art would have been motivated to do this since "light rays which have passed through that surface [lens] portion are collected more closely along the optical axis of the lens" (Yamana et al., col. 4, lines 3-5, Figs. 2 and 8). This increased collection of light rays along the optical axis of the lens enables one to focus the light rays in a particular direction with less scatter toward peripheral directions.

5. **Claim 3** is rejected under 35 U.S.C. 103(a) as being unpatentable over Rosenberg in view of Ito et al., Yamana et al., and the admitted prior art as applied to claim 8 above, and further in view of Fujimura et al. Rosenberg in view of Ito et al., Yamana et al., and the admitted prior art discloses all the limitations of claim 3 except for said first lens having an elongated semi-spherical shape. However, Fujimura et al. teaches such a lens having an elongated semi-spherical shape (see Drawings 1-3 and section "Detailed Description," items 0011 and 0014-0016). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to use the elongated semi-spherical shape of Fujimura et al. for the lens of Rosenberg in view of Ito et al., Yamana et al., and the admitted prior art. One of ordinary skill in the art would have been motivated to do this since "light rays which have passed through that surface [lens] portion are collected more closely along the optical axis of the lens" (Yamana et al., col. 4, lines 3-5, Figs. 2 and 8). This increased collection of light rays along the optical axis of

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the lens enables one to focus the light rays in a particular direction with less scatter toward peripheral directions.

Response to Arguments

6. Applicant's arguments filed on 16 July 2004 (Paper No. 26) have been fully considered but they are not persuasive. Applicant presents two arguments.

Regarding the first argument, Applicant points to limitations that were newly introduced to the claims by Applicant's amendment (16 July 2004, Paper No. 26):

- an IC chip and other electronic parts mounted on an electrode pattern formed on an upper surface of the substrate; and
- the infrared rays emitting elements and the infrared receiving element being connected to the IC chip and the electronic parts for operation.

Examiner respectfully directs attention to the IC chip and electronic parts of Rosenberg. See the treatment of claim 8 above for further details. In view of the IC chip and electronic parts of Rosenberg, Examiner finds it difficult to consider Applicant's first argument to be persuasive.

Regarding the second argument, Applicant states,

"However, the device of Yamana teaches a resin 5 containing SiO₂ powder which has scattering effect but does not teach or suggest the limitations relating to the position of elements and the sectional shape of the lens. Further, the light is not emitted in the X-X direction, but in random directions by the scattering effect. This is radically different from the claimed invention"

Examiner respectfully disagrees. Regarding the position of the plurality of infrared light emitting elements, note the linear positioning of light-emitting diode chips 2 in Fig. 1, col. 3, l. 1-2. This linear positioning leads to expansion of the infrared rays radiation range in an X-direction. Regarding the sectional shape of the first lens, note the elongated shape in the X-direction (Yamana et al., col. 3, lines 21-36, Fig. 2). This shape also leads to expansion of the infrared radiation range in the X-direction. Together, through this positioning of elements and sectional shape of the first lens, it would be noticed by one of ordinary skill in the art that

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infrared rays (from the plurality of infrared rays emitting elements) incident at the first lens surface would inherently refract. In particular, some infrared rays would refract over the two opposing ends along the X-line of first lens, inherently expanding infrared rays radiation range in the X-direction over the two opposing ends of the first lens. Further, while Yamana et al. does not expressly mention scattering in *random* directions, Examiner respectfully notes that scattering in random directions would still include expansion of the infrared rays radiation in the X-direction over the two opposing ends of the first lens. In view of this discussion of Yamana et al., Examiner finds it difficult to consider Applicant's second argument to be persuasive.

Summarily, Applicant's arguments are not persuasive. Accordingly, Examiner respectfully maintains the standing rejections.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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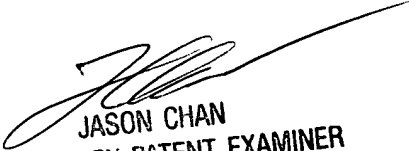
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Any inquiry concerning this communication or earlier communications from the examiner should be directed to David S. Kim whose telephone number is 571-272-3033. The examiner can normally be reached on Mon.-Fri. 9 AM to 5 PM (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on 571-272-3022. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DSK



JASON CHAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600